FIG.1 A GENERAL NETWORK ARRANGEMENT

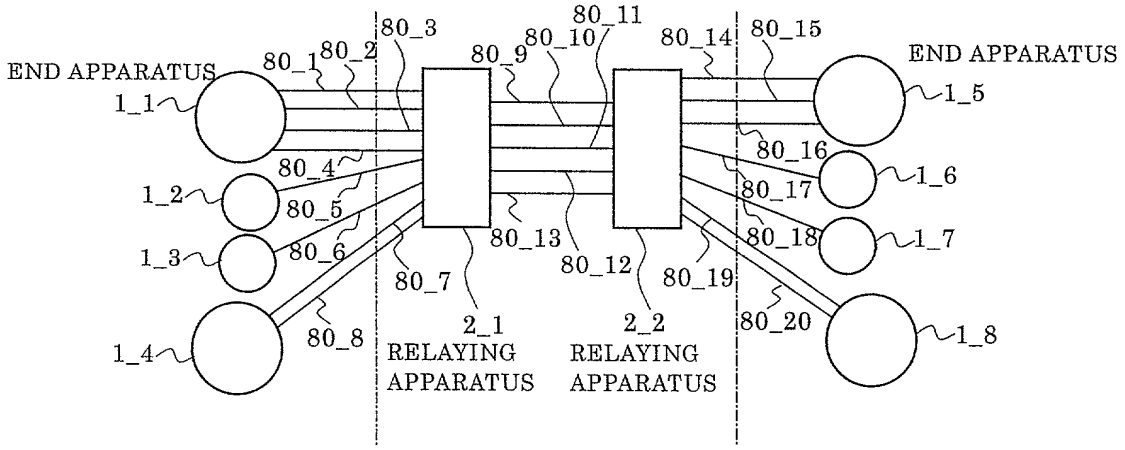


FIG.1 B SPECIFIC NETWORK ARRANGEMENT

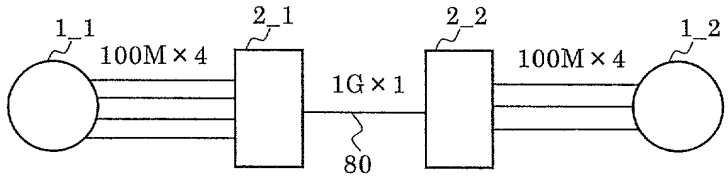


FIG.1 C LINK AGGREGATION & SUB-LOGICAL LINK

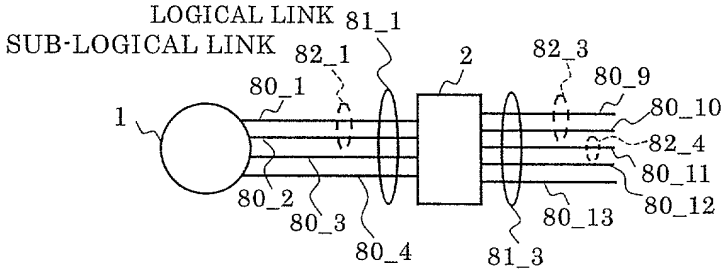
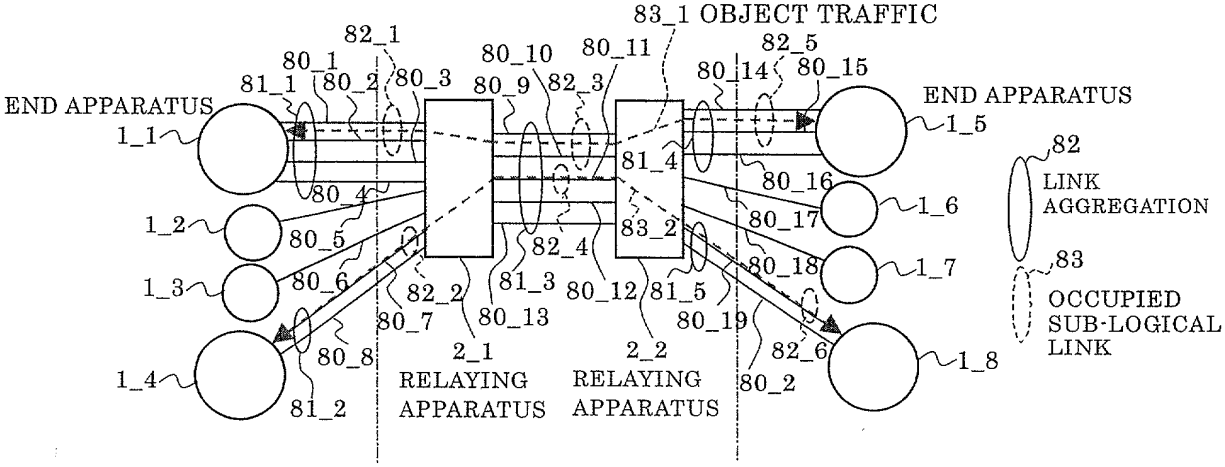
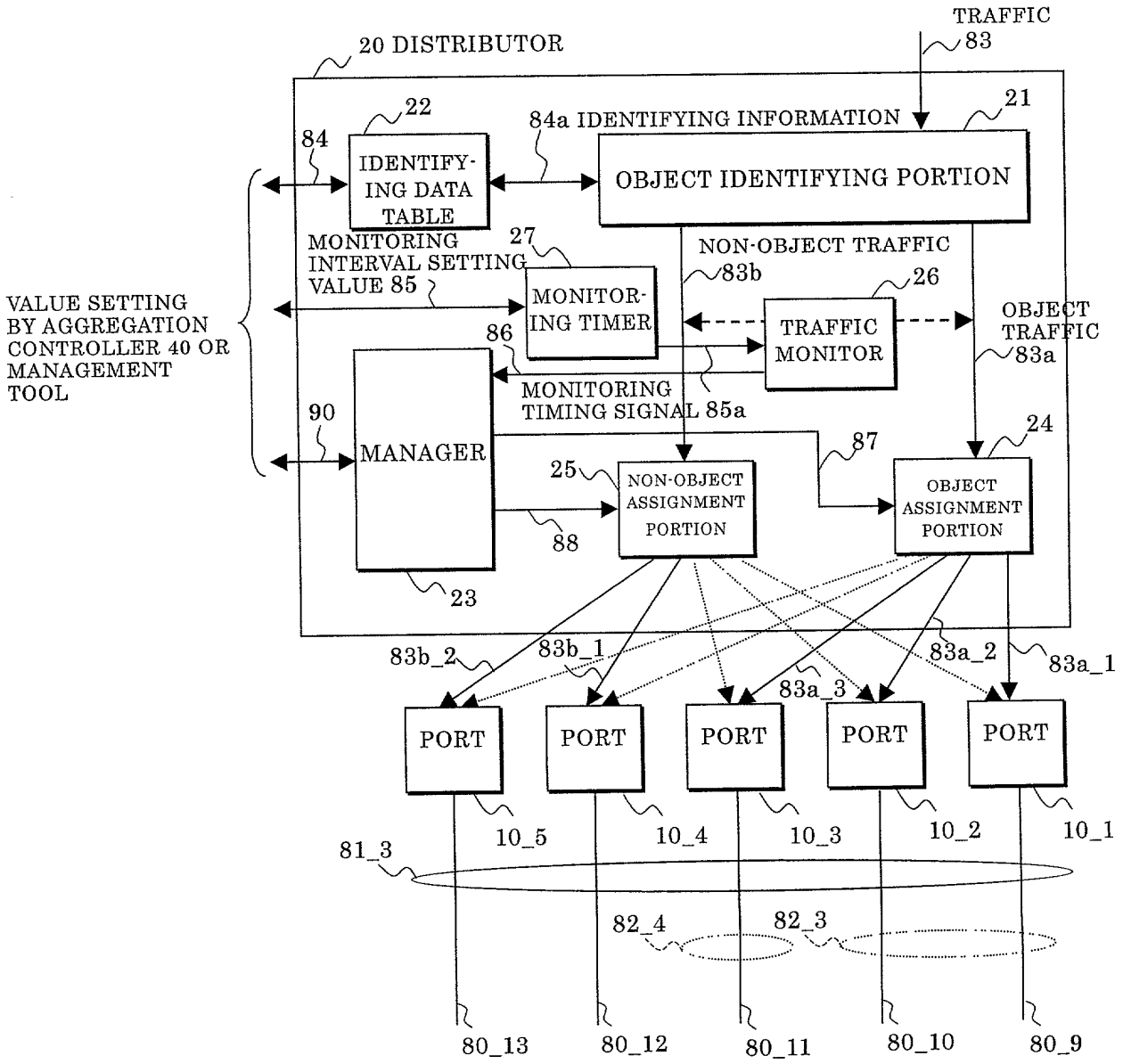


FIG.1 D OPERATION EXAMPLE OF SUB-LOGICAL LINKS



0960476 - 0760464

FIG.2



US 2004/0196859 A1

FIG.3A IDENTIFICATION BASED ON MAC ADDRESS

22

KIND OF IDENTIFYING INFORMATION (IDENTIFYING CONDITION)	VALUE OF IDENTIFYING INFORMATION (CONDITION VALUE)
SOURCE MAC ADDRESS	00:00:0e:14:32:22
DESTINATION MAC ADDRESS	00:e0:5f:53:22:21
⋮	⋮

FIG.3B IDENTIFICATION USING INFORMATION OF IP/TCP HEADER

22

KIND OF IDENTIFYING INFORMATION (IDENTIFYING CONDITION)	VALUE OF IDENTIFYING INFORMATION (CONDITION VALUE)
SOURCE IP ADDRESS	133.10.15.3
DESTINATION IP ADDRESS	124.10.5.38
DESTINATION PORT NO.	69
⋮	⋮

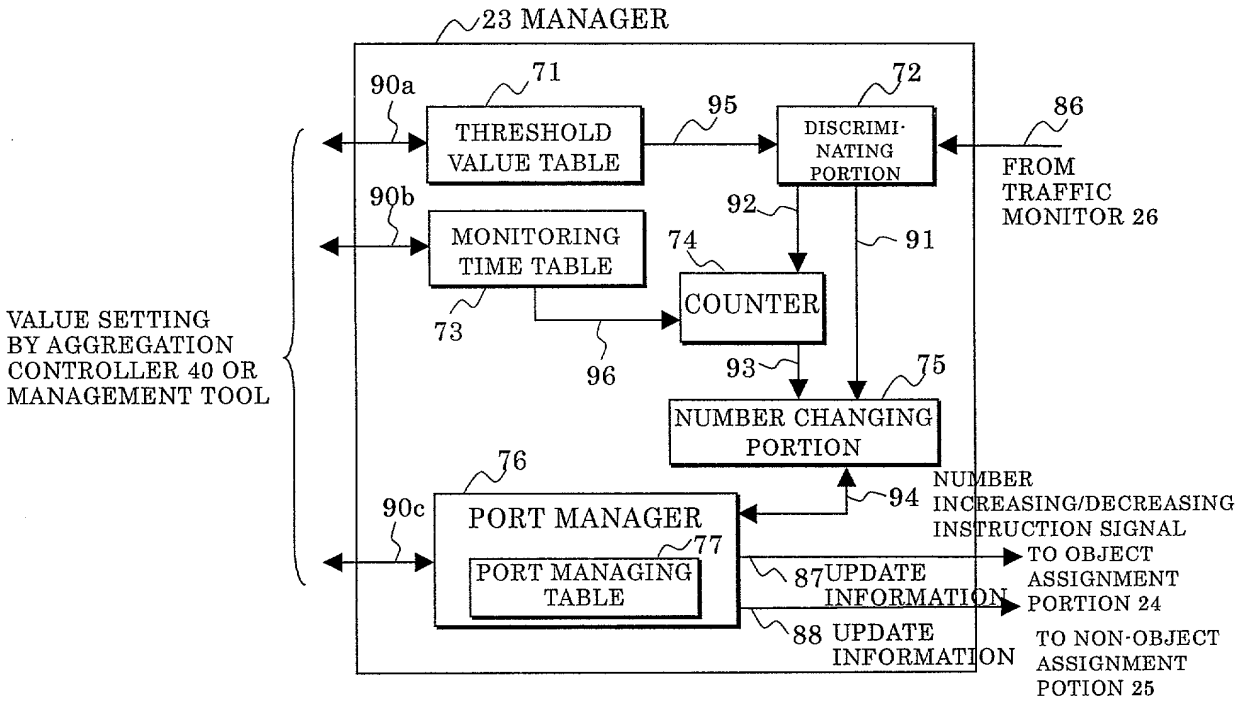
FIG.3C IDENTIFICATION CORRESPONDING TO SUB-LOGICAL LINKS

22

KIND OF IDENTIFYING INFORMATION (IDENTIFYING CONDITION)	VALUE OF IDENTIFYING INFORMATION (CONDITION VALUE) (SUB-LOGICAL LINK 82_3)	VALUE OF IDENTIFYING INFORMATION (CONDITION VALUE) (SUB-LOGICAL LINK 82_4)	...
SOURCE MAC ADDRESS	00:00:0e:14:32:22	—	...
DESTINATION MAC ADDRESS	00:e0:5f:53:22:21	—	...
SOURCE IP ADDRESS	—	12.35.120.25	...
DESTINATION IP ADDRESS	—	122.131.11.221	...
PORT NO.	—	69	...
⋮	⋮	⋮	...

0004156-0376301

FIG.4



09904265 - 09-12-04

FIG.5A

THRESHOLD VALUE TABLE 71

OCCUPATION NUMBER	TRAFFIC AMOUNT	PORT AVAILABLE RATE FOR OBJECT TRAFFIC	PORT AVAILABLE RATE FOR NON-OBJECT TRAFFIC
1	80Mbps	80%	80%
2	160Mbps		
3	240Mbps		
4	320Mbps		
⋮	⋮		

FIG.5B

MONITORING TIME TABLE 73

CORRESPONDING COUNTER	COUNT
RELEASING COUNTER	50 TIMES
DECREASING COUNTER	50 TIMES

FIG.5C

PORT MANAGING TABLE 77

PORT	FOR OBJECT TRAFFIC
10_1	○
10_2	○
10_3	○(□→○)
10_4	□
10_5	□

○:OCCUPIED PORT(PORT FOR OBJECT TRAFFIC)

□:NON-OCCUPIED PORT(PORT FOR NON-OBJECT TRAFFIC)

US 2004/0196859 A1 Oct. 7, 2004

FIG.6

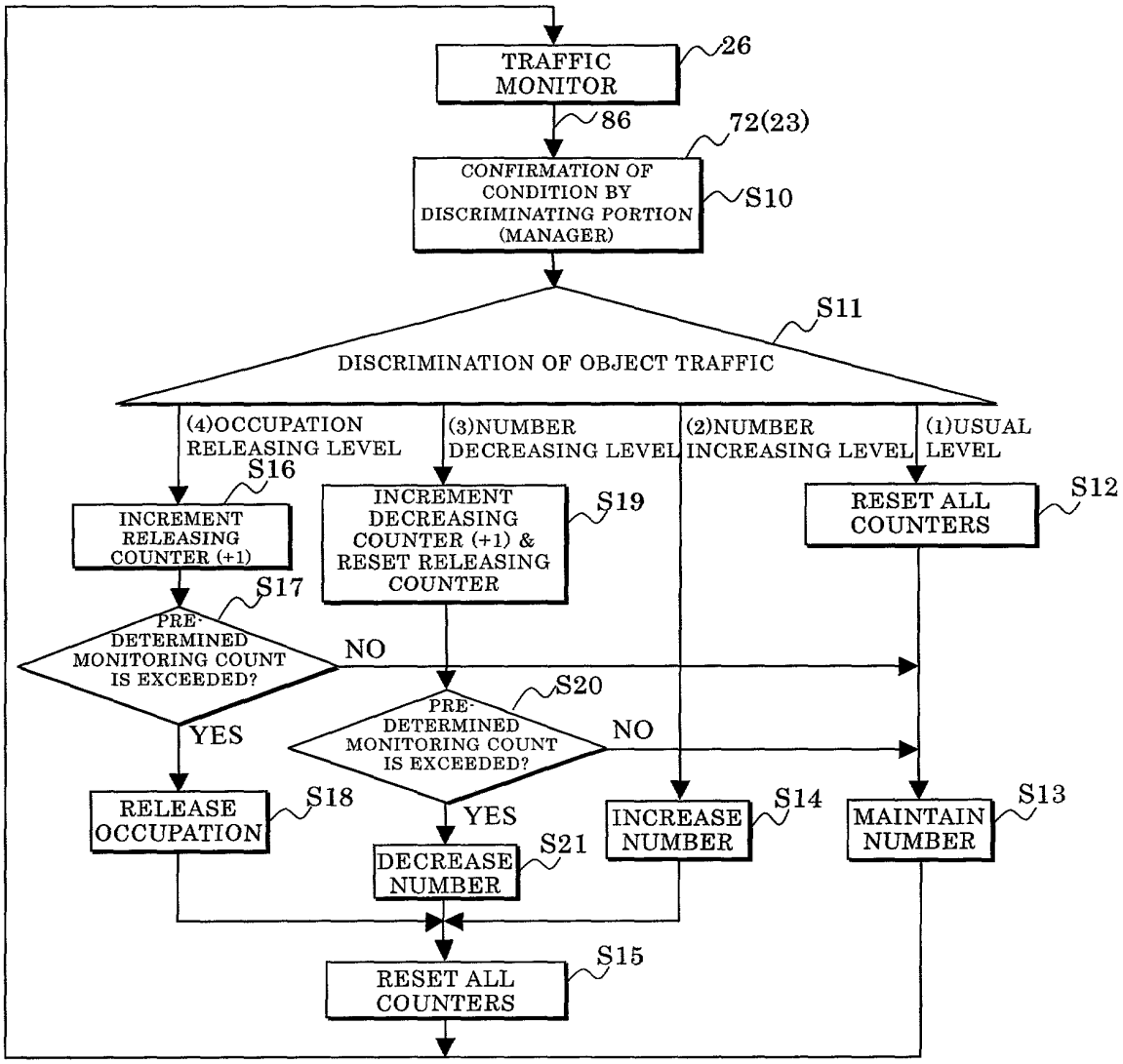

TRAFFIC MONITOR
26
86
72(23)
CONFIRMATION OF CONDITION BY DISCRIMINATING PORTION (MANAGER)
S10
S11
DISCRIMINATION OF OBJECT TRAFFIC
(4)OCCUPATION RELEASING LEVEL
(3)NUMBER DECREASING LEVEL
(2)NUMBER INCREASING LEVEL
(1)USUAL LEVEL
S16
INCREMENT RELEASING COUNTER (+1)
S19
INCREMENT DECREASING COUNTER (+1) & RESET RELEASING COUNTER
RESET ALL COUNTERS
S12
S17
PRE-DETERMINED MONITORING COUNT IS EXCEEDED?
NO
YES
S20
PRE-DETERMINED MONITORING COUNT IS EXCEEDED?
NO
YES
RELEASE OCCUPATION
S18
DECREASE NUMBER
S21
INCREASE NUMBER
S14
MAINTAIN NUMBER
S13
RESET ALL COUNTERS
S15

FIG.7

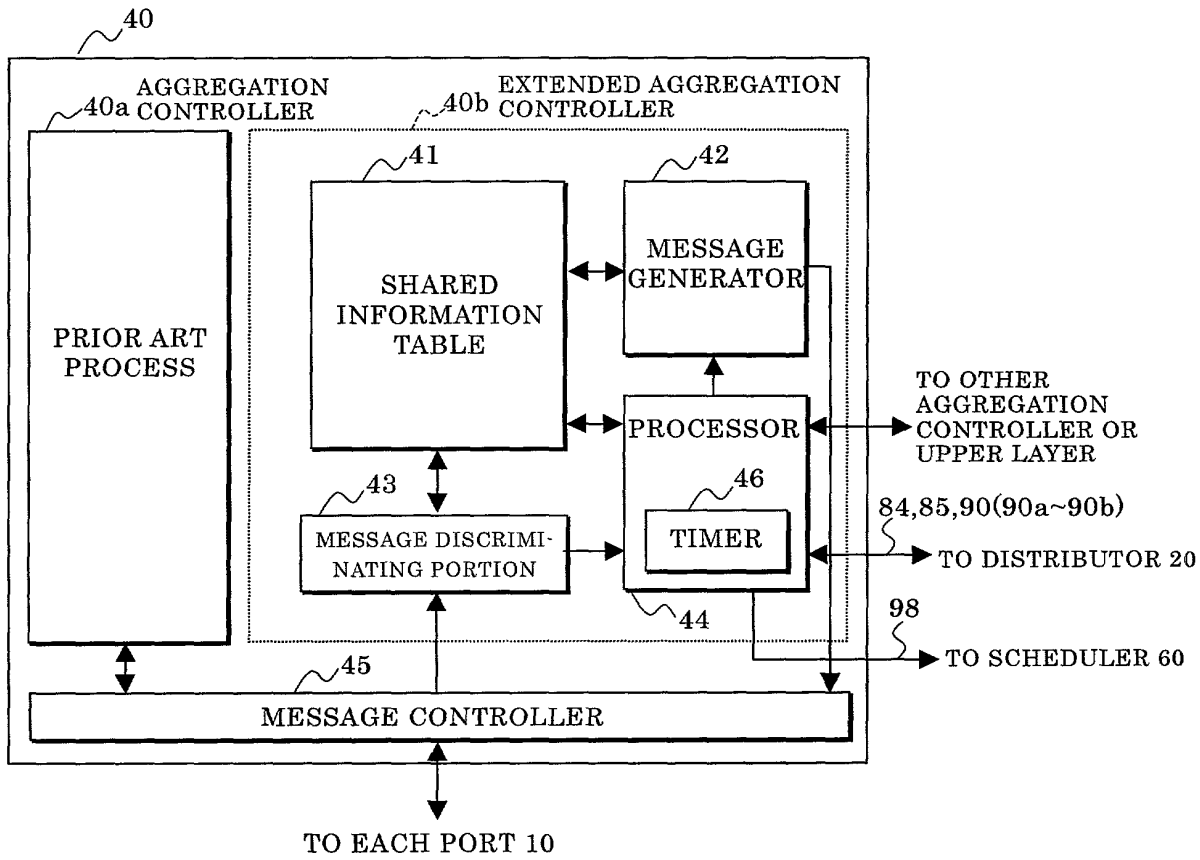

40
AGGREGATION CONTROLLER
40a
EXTENDED AGGREGATION CONTROLLER
40b
PRIOR ART PROCESS
41
SHARED INFORMATION TABLE
42
MESSAGE GENERATOR
PROCESSOR
TO OTHER AGGREGATION CONTROLLER OR UPPER LAYER
43
MESSAGE DISCRIMI-NATING PORTION
46
TIMER
84,85,90(90a~90b)
TO DISTRIBUTOR 20
98
TO SCHEDULER 60
44
45
MESSAGE CONTROLLER
TO EACH PORT 10

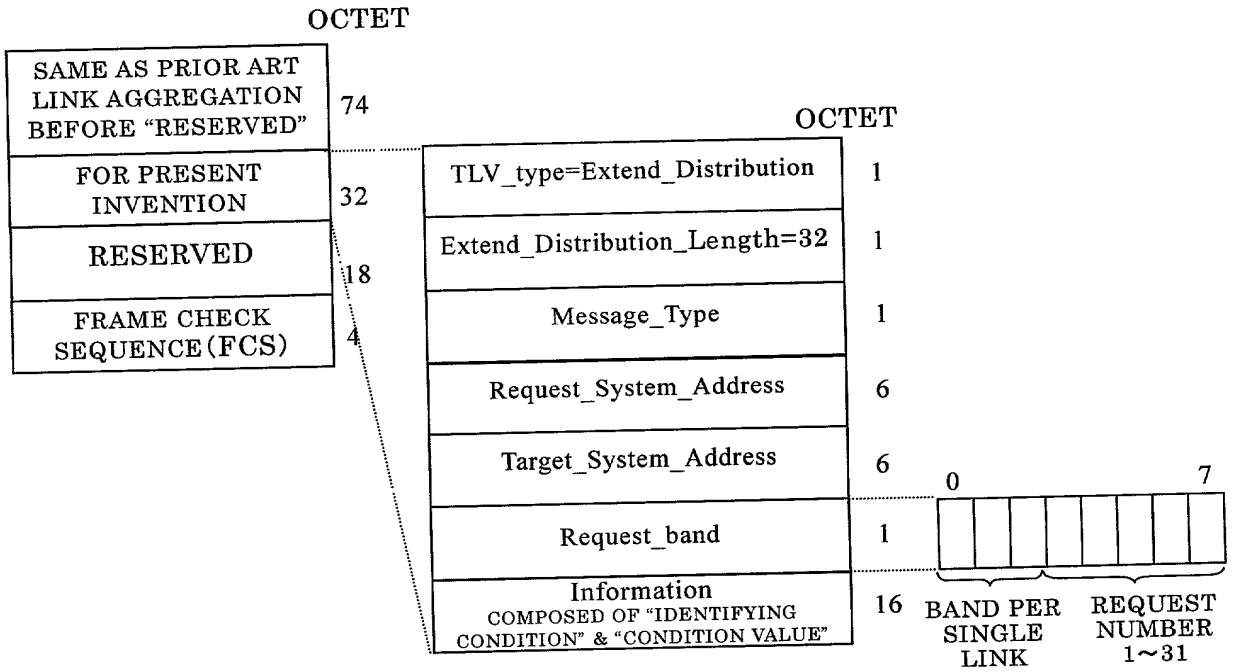
FIG.8

41

	SUB-LOGICAL LINK 82_3	SUB-LOGICAL LINK 82_4	...
OCCUPATION FLAG	on	on	...
REQUEST NUMBER	2	1	...
REQUEST BAND PER SINGLE LINK	100(Mbps)	100(Mbps)	...
REQUEST SOURCE ADDRESS	00:00:0e:14:32:22	00:00:0e:14:32:29	...
DESTINATION ADDRESS	00:e0:5f:53:22:21	00:e0:5f:53:22:26	...
IDENTIFYING CONDITION 1	SOURCE MAC ADDRESS	SOURCE IP ADDRESS	...
CONDITION VALUE 1	00:00:0e:14:32:22	12.35.120.25	...
IDENTIFYING CONDITION 2	DESTINATION MAC ADDRESS	DESTINATION IP ADDRESS	...
CONDITION VALUE 2	00:e0:5f:53:22:21	122.131.11.221	...
IDENTIFYING CONDITION 3	NONE	DESTINATION PORT NO.	...
CONDITION VALUE 3	—	69	...
IDENTIFYING CONDITION 4	—	NONE	...
CONDITION VALUE 4	—	—	...
⋮	⋮	⋮	...

09904466 - 07/12/06

FIG.9



Message_Type
- 01: REQUEST
- 02: RESPONSE
- 03: REJECTION
- 04: ERROR (NUMBER)
- 05: ERROR (OCCUPIED)
- 06: REQUEST FROM RELAYING APPARATUS
- 07: RELEASE REQUEST
- 8X: MESSAGE IN A SINGLE LINK (X:1~7)

001:10Mbps
010:100Mbps
011:1Gbps
100:10Gbps

EP 2 276 205 A1

FIG.10A USUAL SEQUENCE

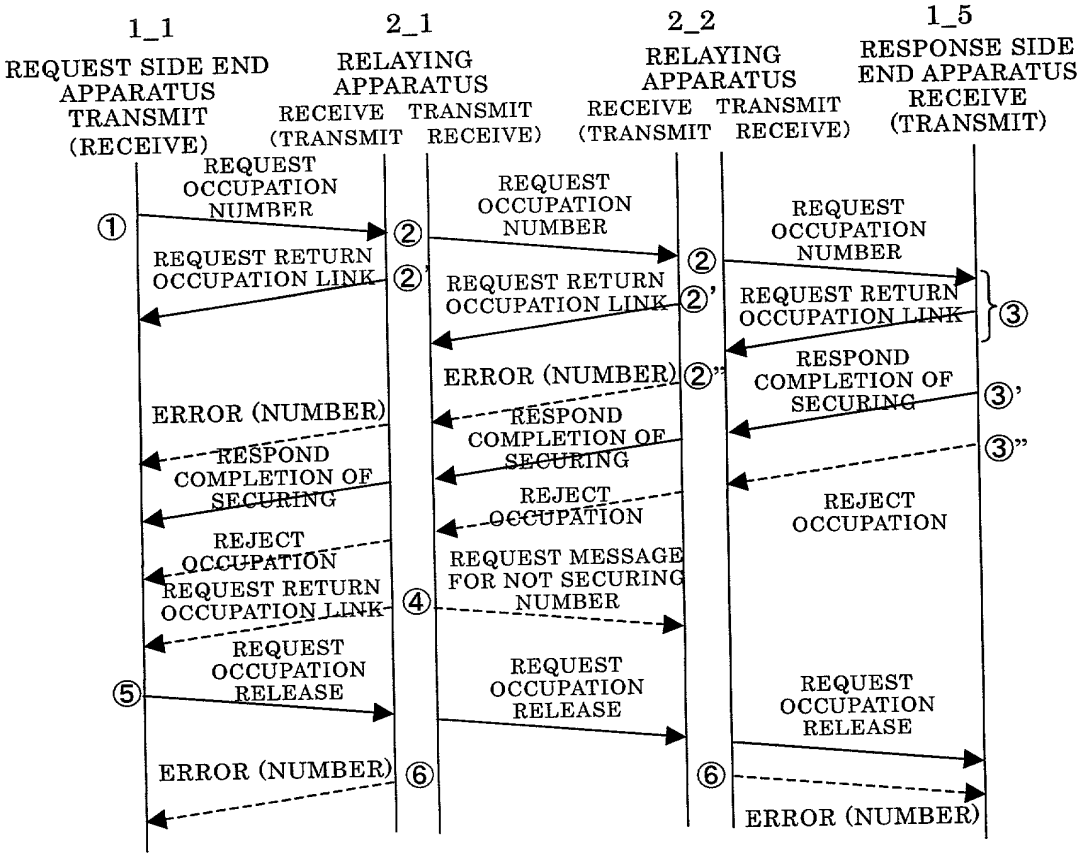


FIG.10B SEQUENCE UPON REQUEST OVERLAPPED

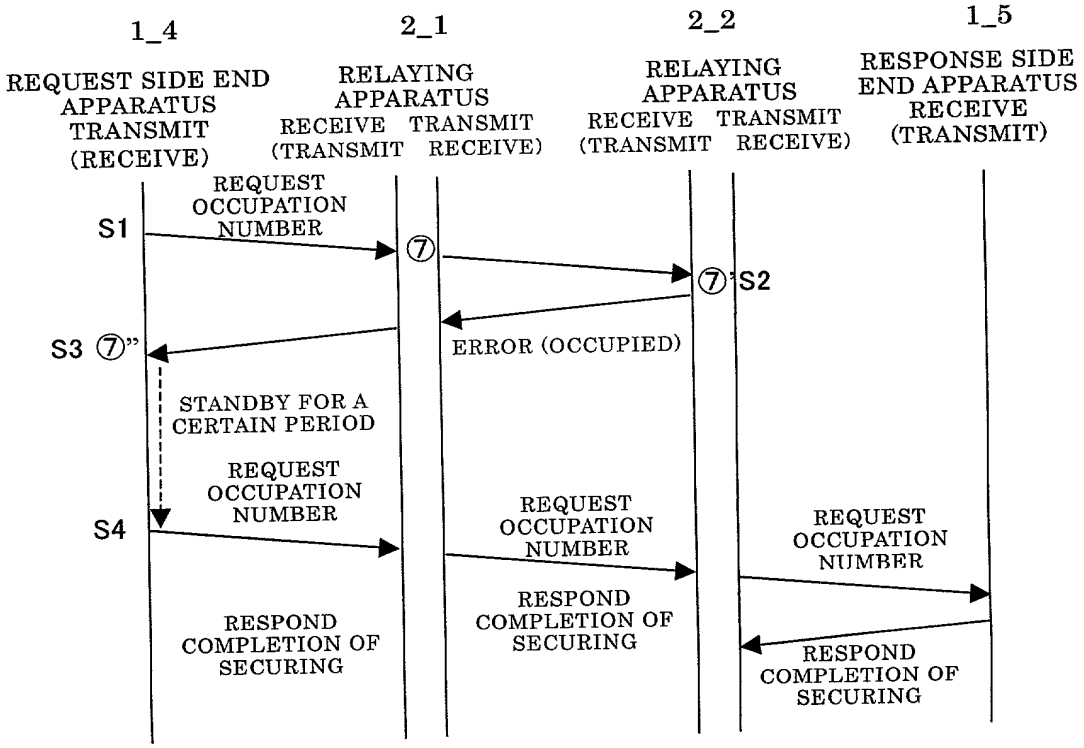
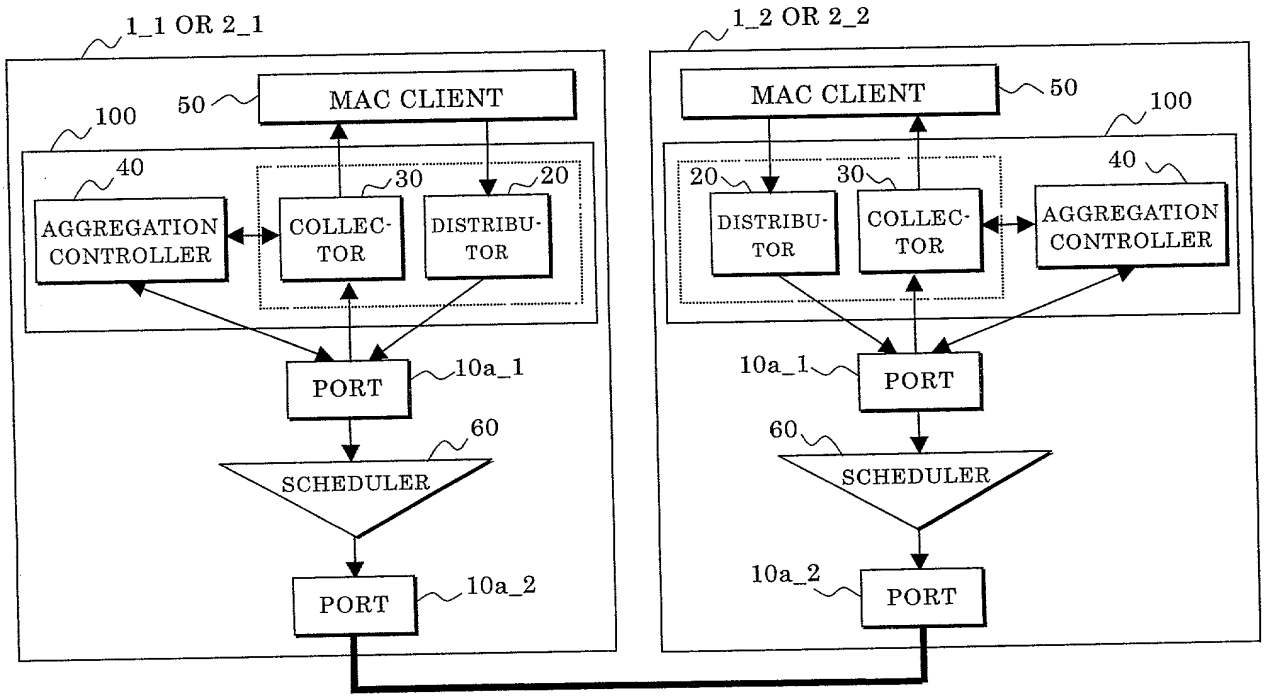


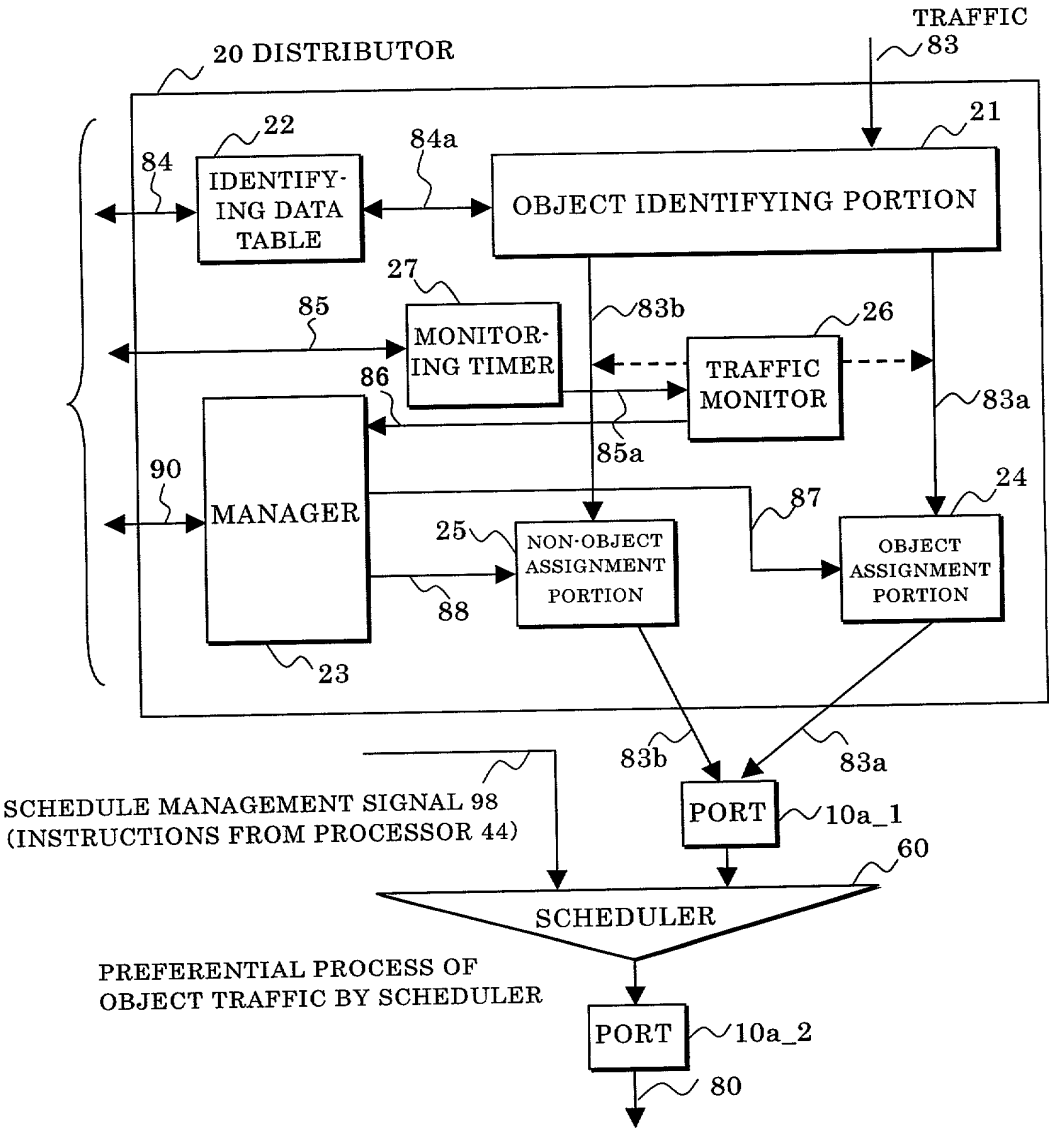
FIG.11



PREFERENTIAL PROCESS OF OBJECT TRAFFIC BY SCHEDULER

09904866 - 09-04-08

FIG.12

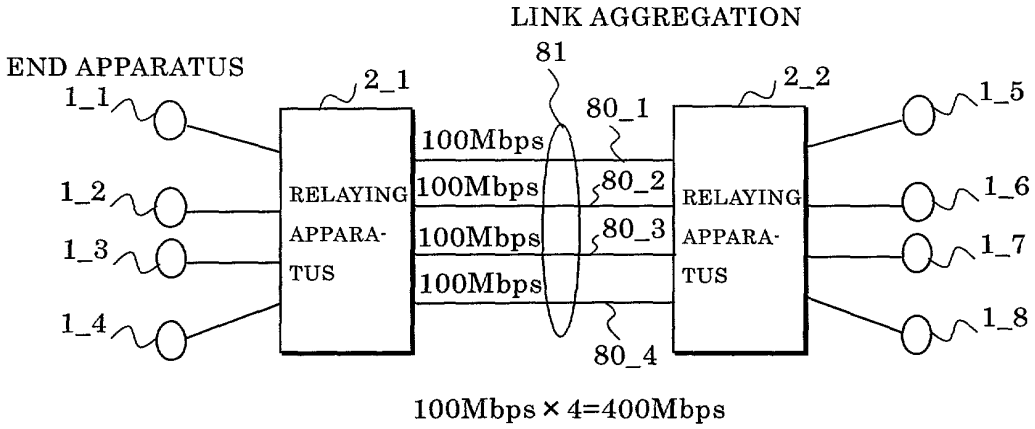


09804365 - 032202

PRIOR ART

FIG.13A

OUTLINE OF LINK AGGREGATION



100Mbps × 4=400Mbps

FIG.13B

OUTLINE OF LINK AGGREGATION PORT FUNCTION

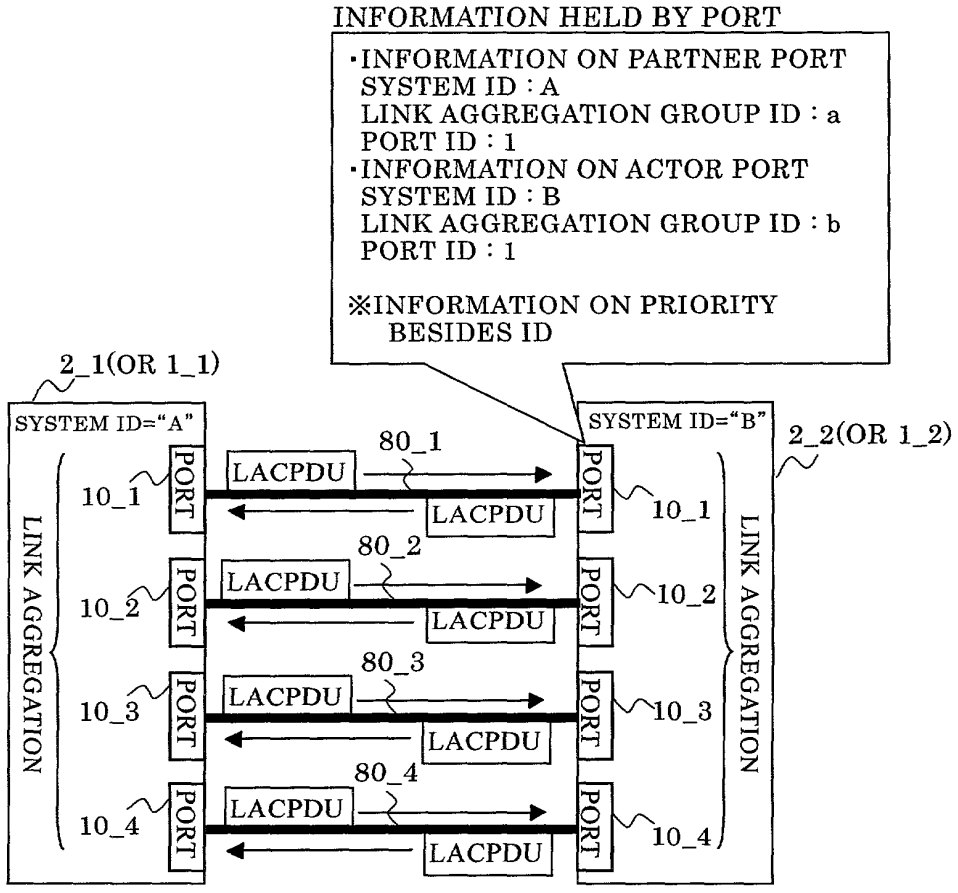


FIG.14A

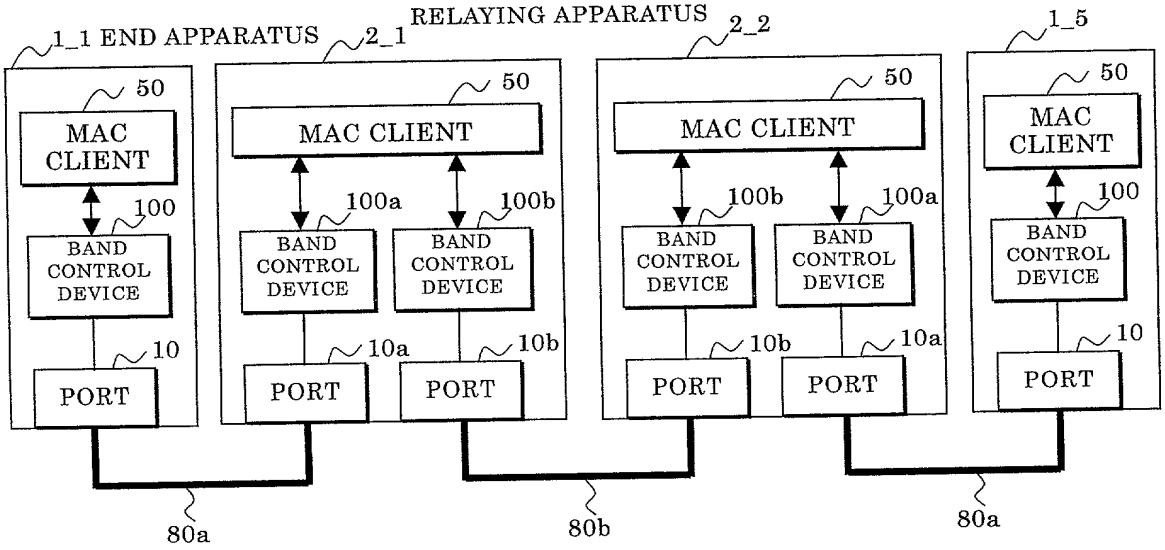


FIG.14B

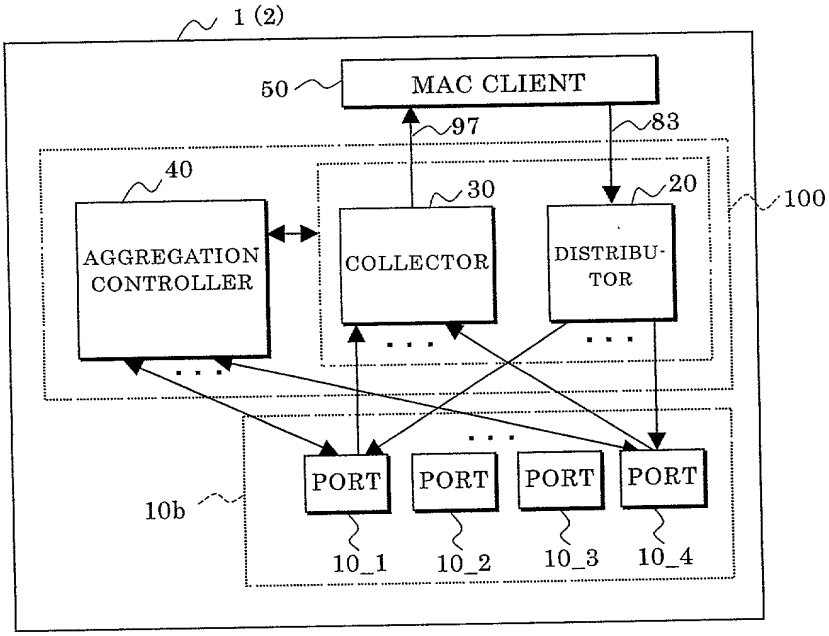
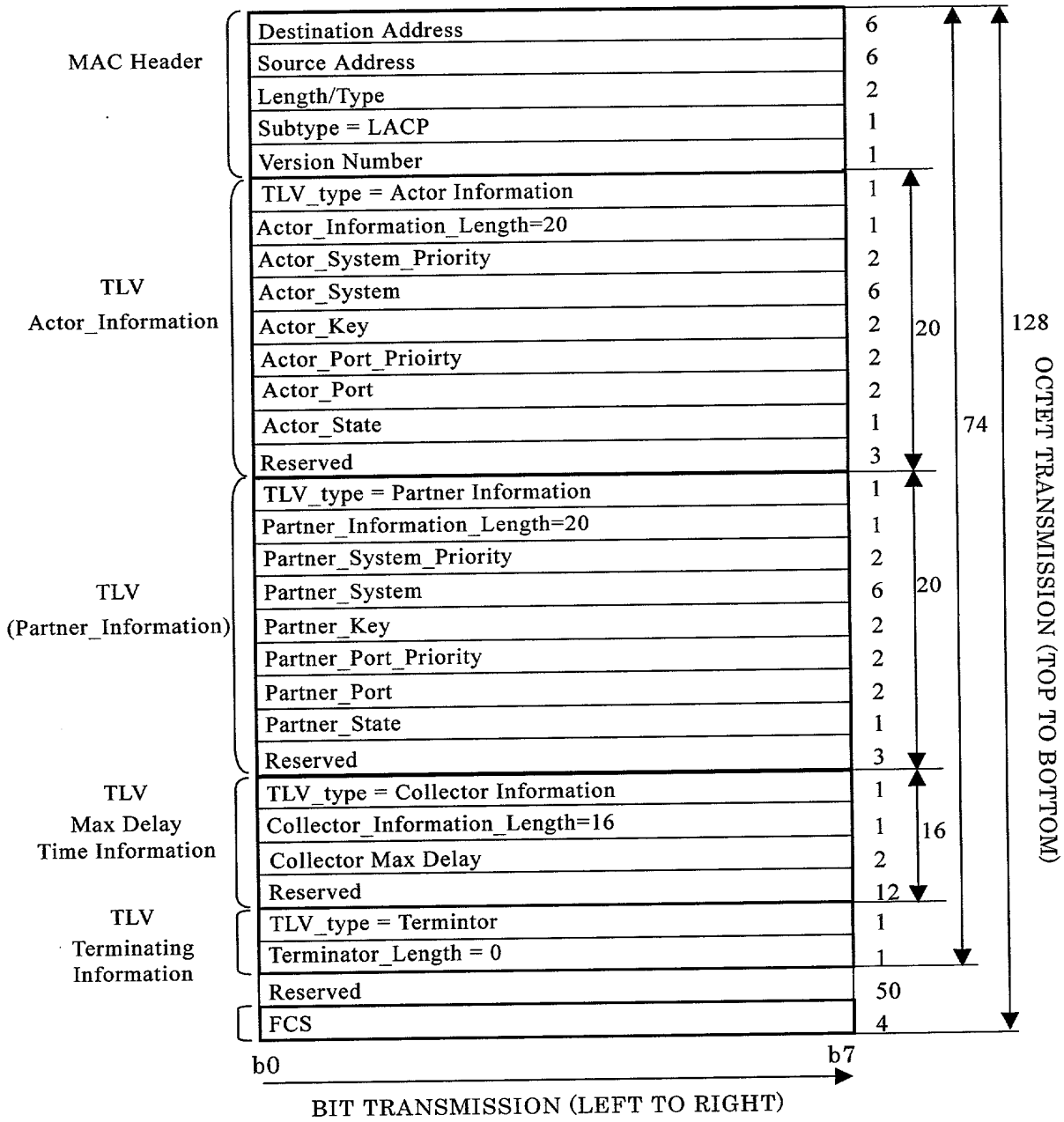


FIG.15


MAC Header
Destination Address 6
Source Address 6
Length/Type 2
Subtype = LACP 1
Version Number 1
TLV
Actor_Information
TLV_type = Actor Information 1
Actor_Information_Length=20 1
Actor_System_Priority 2
Actor_System 6
Actor_Key 2
Actor_Port_Prioirty 2
Actor_Port 2
Actor_State 1
Reserved 3
20
TLV
(Partner_Information)
TLV_type = Partner Information 1
Partner_Information_Length=20 1
Partner_System_Priority 2
Partner_System 6
Partner_Key 2
Partner_Port_Priority 2
Partner_Port 2
Partner_State 1
Reserved 3
20
TLV
Max Delay
Time Information
TLV_type = Collector Information 1
Collector_Information_Length=16 1
Collector Max Delay 2
Reserved 12
16
TLV
Terminating
Information
TLV_type = Termintor 1
Terminator_Length = 0 1
74
Reserved 50
FCS 4
128
OCTET TRANSMISSION (TOP TO BOTTOM)
b0
b7
BIT TRANSMISSION (LEFT TO RIGHT)